Progressive Ground Depression, Scarp Formation and Pond-Associated Change beside Preston New Road

Temporal aerial imagery, satellite chronology and LiDAR differencing, 2017–2026

Working location study for expert and regulatory feedback

Title-page image: 9 July 2026 wide view of the field-depression area with the new standing water area in the foreground.

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1 August 2026

Status: working location study; not a causal determination

Series Note: This report forms part of the July 2026 report series, which is itself included within the wider Fylde Papers archive.

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1. Purpose and scope

This report brings together two closely related location studies concerning changing ground and water features in the pasture immediately adjoining the Preston New Road site. The combined record documents a progressively formed scarp-like depression complex near the A583, a separate field depression that becomes increasingly legible through time, an emergent pond-like feature within the same field system, the changing condition of nearby Teardrop Pond, and their spatial relationship to a wider 2018–2022 LiDAR lowering pattern extending toward and around the pad.

The main value of the record lies in temporal persistence and spatial grouping. None of the features is decisive in isolation. The evidential question is whether the combined chronology is coherent enough to justify treating the area as one monitoring problem involving repeated water-sensitive ground, local surface lowering, exposed sediment, pond development and changing pond condition.

The report is location-specific but system-aware. Its practical purpose is to place the combined observational record in one document before further weathering, grazing, agricultural management, restoration activity or pad-related ground disturbance alters the present surface expression.

Central evidential question

Does the combined aerial, satellite and LiDAR chronology justify treating the scarp-like feature, field depression, pond-like feature and changing nearby pond conditions as linked expressions within one local ground-water adjustment problem requiring coordinated inspection and measurement?

2. Location and relationship between the observed features

The features considered here lie in pasture east and north-east of the Preston New Road pad, close to the A583 and within the same short field system. Four elements are considered together:

- A. Scarp-like depression complex near the hedge and road junction.
- B. Field depression developing in adjacent pasture.
- C. Pond-like feature that becomes established within the same field system.
- D. Teardrop Pond, an established nearby water body retained as contextual evidence.

Although the archive contains images from differing directions, heights and years, the locality can be fixed qualitatively using the A583 alignment, lighting columns, hedge junctions, field boundaries, farm access, nearby ponds and the relative position of the pad.

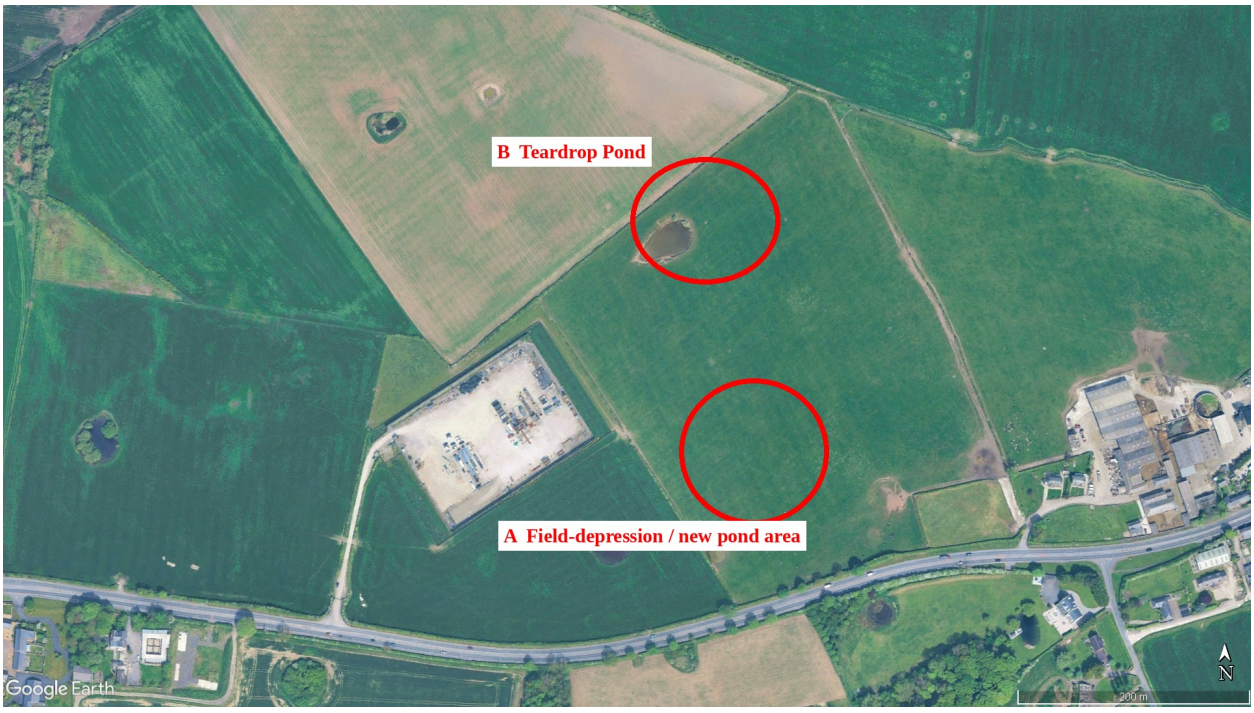

Figure 1. Google Earth context image showing the principal field-depression/pond-like-feature area and Teardrop Pond. Red outlines are locational aids and do not represent measured boundaries.

Figure 2. July 2026 oblique view showing the mature exposed scarp-like feature beside the hedge junction and road. The feature has a broad exposed apron, a locally abrupt head margin and several rounded hollow or scallop-like forms.

The closeness of these features does not itself establish a common source or pathway. It does mean that assessing each feature in isolation is less satisfactory than assessing the group as a single local pattern.

3. Evidence base, terminology and interpretation controls

This section sets out the explicit evidential limits for the whole report. To avoid repetition, these constraints govern the reading of all later sections.

3.1 Evidence base

Evidence source	What it can establish	What it cannot establish on its own
Repeat UAV imagery	Persistence, emergence, changing morphology, ponding, visible sediment or colour expression	Exact elevation, chemistry, subsurface pathway or causation
Google Earth chronology	Broad timing of feature appearance and persistence across independent epochs	Fine morphology, exact field condition or hydraulic connection
2018–2022 LiDAR differencing	Relative elevation change and spatial coherence of lowering	Present-day depth, engineering settlement or mechanism
July 2026 field observations	Short-interval change, bubbling observations and current surface condition	Source, composition or long-term hydraulic behaviour without measurement
Berhanu et al. (2012)	Process-informed comparison for seepage-driven headward erosion and bank failure	Direct equivalence between laboratory granular beds and cohesive agricultural soils

3.2 Terminology

- Scarp-like: an abrupt local break or head margin visible in the field surface.
- Field depression: a recurring low or stressed area visible in repeat imagery.
- Pond-like feature: a surface depression that becomes bare, wet or water-filled through time.
- Ponding: standing water visible in imagery.
- Lowering: negative relative elevation difference in the 2018–2022 LiDAR comparison.
- Seepage-related ground adjustment / seepage erosion hypothesis: a testable working explanation involving repeated near-surface water movement, local weakening, sediment mobilisation and progressive surface change.

3.3 Interpretation controls

1. Differences in angle, altitude, illumination, vegetation condition and season can alter apparent colour and relief.
2. Water colour, films and pale surface material are descriptive observations, not chemical determinations.
3. Bare ground may be enlarged or modified by cattle, vehicles, drainage work, drought or routine agricultural activity.
4. Google Earth imagery is corroborative and should be checked against original date metadata before formal issue.
5. LiDAR values represent relative 2022-minus-2018 difference, not surveyed present-day ground depth.
6. Spatial association between the scarp, field depression, pond-like feature, Teardrop Pond and pad does not by itself establish a shared pathway or source.
7. Observed bubbling should be supported, where possible, by retained video and repeat direct measurement.

These are the governing limits for the whole report.

4. Temporal formation of the scarp-like depression complex

The strongest evidence at the scarp locality is its multi-year development rather than its appearance in any one survey. The sequence shows progression from recurrently wet or differentiated ground to a persistent exposed feature with increasing morphological relief.

Figure 3. Selected temporal sequence. Top left: 29 September 2017, with local wet or pale ground at the field corner. Top right: 23 May 2019, when an irregular exposed form is established. Bottom left: 19 March 2025, showing a mature exposed apron and

nearby circular sediment expression. Bottom right: 9 July 2026, showing a pronounced scarp-like head and compound hollowed morphology.

4.1 Phase 1 – precursor wetness and surface differentiation (2017–early 2018)

The September–November 2017 imagery records repeated local wetness, pale material and bare or poorly vegetated ground near the hedge and access junction. Wider frames also show water-sensitive conditions in adjacent field units. These early expressions are not yet a mature scarp. Their value is that they locate persistent hydrological and surface differentiation before the later morphology becomes pronounced.

During March–April 2018, the same field corner and neighbouring enclosed field again show wetness and standing water. Land use and viewing conditions vary, but the sequence establishes that the locality repeatedly behaved as a low or water-sensitive part of the field system.

4.2 Phase 2 – emergence of a structured surface form (mid-2018 to 2019)

By mid-2018 the area shows increasingly coherent vegetation contrast and exposed ground. Curving tracks and field-use marks remain visible, but the developing feature becomes distinguishable through its broader irregular outline and local relief. By 2019, the locality is no longer adequately described as a diffuse wet patch: the archive shows a broad exposed apron, an abrupt headward margin and associated small hollows.

The May–August 2019 frames are particularly important because they show the developing form under relatively green surrounding pasture. The feature persists while its internal surface and surrounding tracks are reworked.

4.3 Phase 3 – mature scarp, sediment expression and compound hollows (2024–2026)

The 2024–2026 imagery shows a mature, persistent feature. By March 2025, the principal scarp-like exposure is accompanied by a separate circular area of contrasting sediment staining or exposed material and, further east toward the roadside field margin, a smaller mound or disturbed patch cluster retained here as feature C. In January and July 2026 the head margin is more sharply expressed and several rounded hollow or scallop-like elements are visible along the exposed edge.

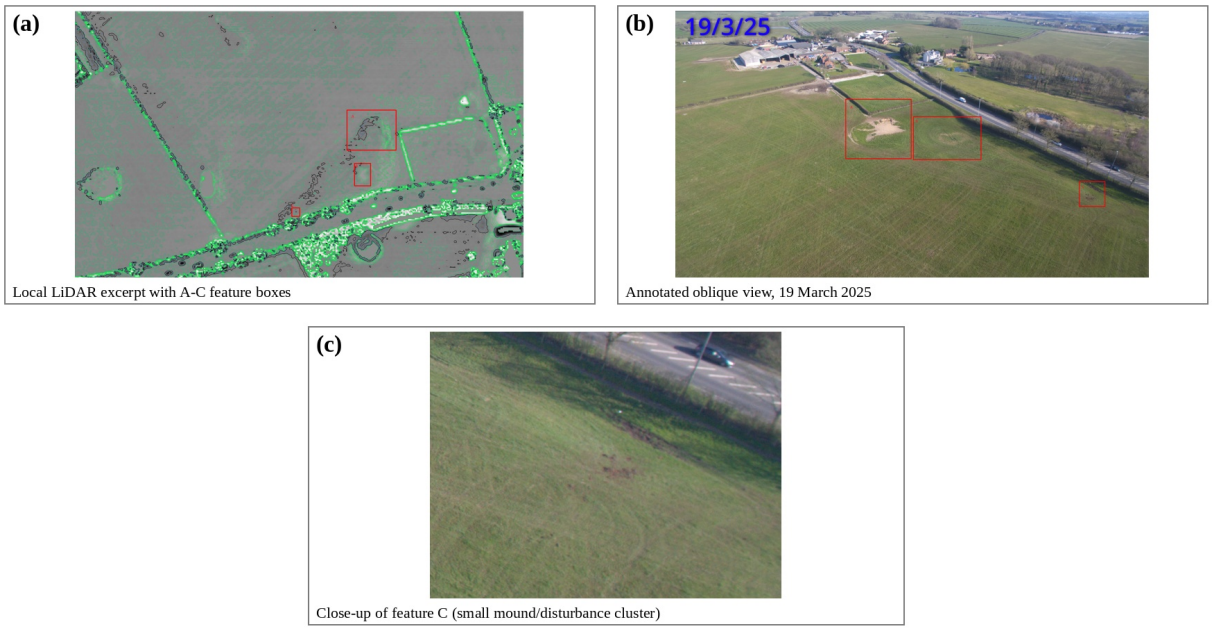

Figure 4. March 2025 local comparison and feature-C close-up. (a) Local LiDAR excerpt showing the relative positions of A–C within the lowering lobe. (b) Annotated oblique view from 19 March 2025. (c) Close-up of feature C. A: principal scarp-like exposure and apron. B: separate circular depression with contrasting sediment staining or exposed material. C: small mound or disturbed patch cluster near the roadside field margin.

Taken together, the sequence supports an observational conclusion: the location evolved from recurrently wet or differentiated ground into a persistent scarp-depression complex with exposed sediment and enhanced relief.

5. Associated ponding and sediment expression around the scarp

Ponding is not confined to one date or one exact point. The archive records standing water in the immediate field system and adjacent low ground over several years. The locality therefore needs to be understood as a scarp-pond complex rather than an isolated bare patch.

Figure 5. Ponding and water-sensitive ground in the immediate vicinity. The panels show repeated saturation or standing water in 2017, 2018 and 2019, followed by a persistent nearby pond in July 2024. Different angles are used; field boundaries and the A583 provide location control.

5.1 Water-filled depression and nearby pond

By September–October 2019, a water-filled depression is visible near the developing scarp feature, while broader ponding affects the adjacent enclosed field. A persistent nearby pond is clearly present by July 2024. A 9 July 2026 wide view shows the pond and mature scarp complex within the same short field reach, and a 10 July 2026 near-vertical frame records the pond state one day later. Their proximity and parallel development make separate assessment of each feature insufficient.

5.2 Sediment staining in March 2025

The March 2025 imagery shows contrasting sediment expression both within the main scarp apron and in a separate circular depression. The appearance of sediment at or near a depression records more than vegetation dieback alone and is relevant to a hypothesis involving water-assisted material mobilisation. The same frame records the smaller mound/disturbance cluster at feature C near the field margin; on its own it is non-diagnostic, but it remains useful as a comparison point.

6. Temporal development of the separate field depression

A second line of evidence comes from the nearby field depression. The main point is again recurrence at the same locality through time. Across the archive, a subtle and spatially recurrent area becomes increasingly legible as vegetation contrast, local wetness, a shallow depression and finally broad exposed sediment.

6.1 Early differentiation and intermittent ponding (2017–2019)

The 2017–2019 frames show a low-contrast precursor rather than the mature 2026 form. Local vegetation texture and colour differ from the surrounding pasture, and intermittent water is visible within or immediately beside the same broader area. By October 2019, small standing-water expressions are present at more than one point, indicating that the field was already behaving as a water-sensitive surface before the later broad bare patches became obvious.

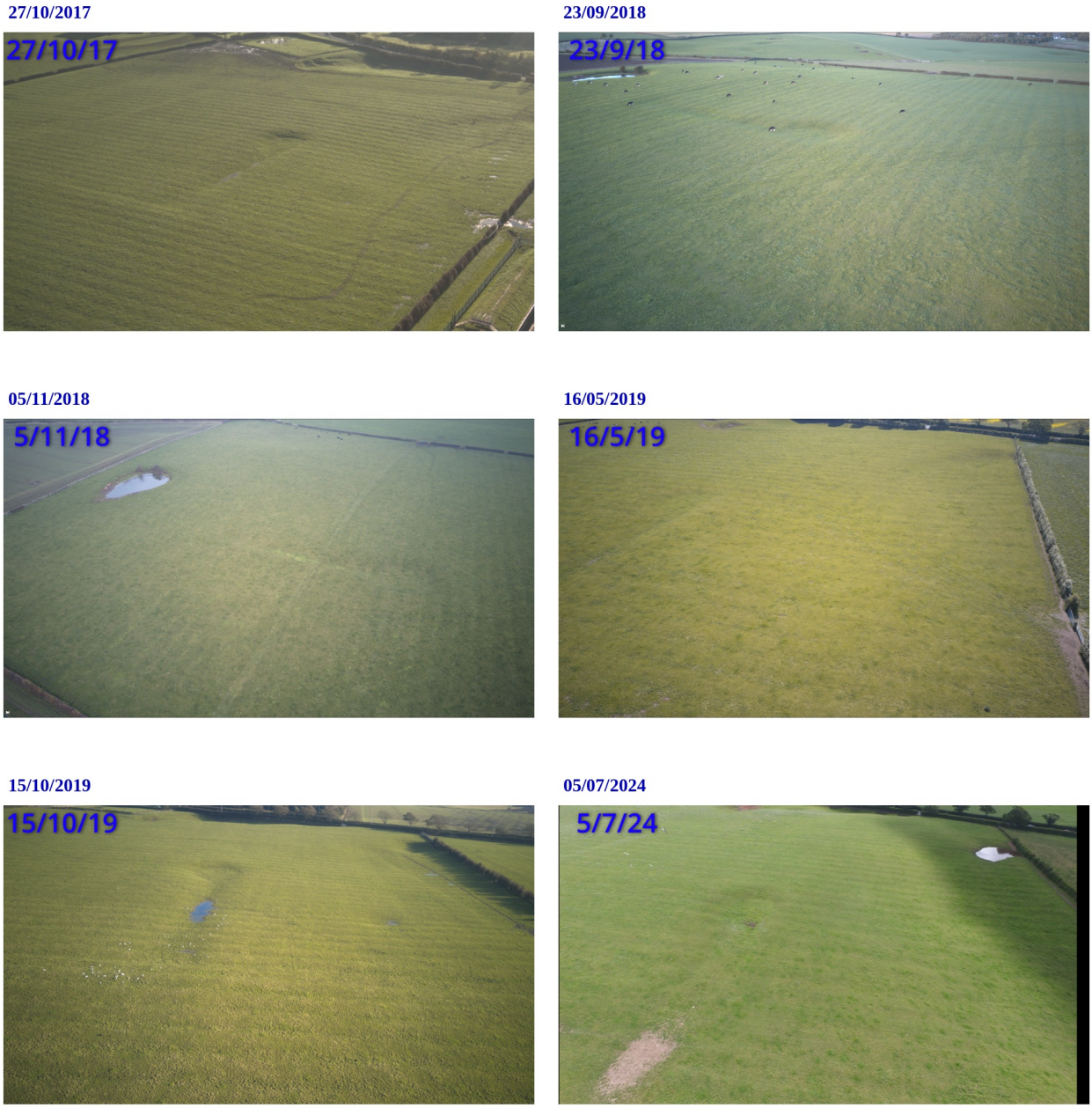

Figure 6. Selected sequence from October 2017 to July 2024. The same field locality repeatedly shows vegetation differentiation, intermittent wetness or standing water, and later a more distinct bare or depressed expression. The sequence is qualitative because camera angle and field condition vary.

6.2 Enlargement and exposed sediment (2024–2026)

By July 2024 the depression is more readily distinguished from surrounding pasture. The December 2025 and February 2026 frames show a persistent darker or stressed area within the same field. On 9 July 2026 the locality

appears as a broad exposed sediment patch, with a second smaller bare patch nearby. The feature remains legible from several opposing angles, reducing the possibility that it is solely an illumination effect.

Figure 7. Progression from December 2025 to July 2026. The field develops from a dark or stressed local expression into broad exposed sediment with a second nearby bare patch. Dates are embedded in the supplied frames.

Figure 8. Three views from 9 July 2026. Opposing and wider angles show that the exposed patches occupy the same field-scale low or stressed zone and are not solely a single viewing-angle effect.

7. Emergence and short-interval variability of the pond-like feature

7.1 Independent satellite chronology

The Google Earth sequence provides an independent, lower-detail chronology. At the selected location, the 2017 image does not show the later elongated expression clearly. A faint differentiated area is visible by 2020, and by 2021 the feature is sufficiently coherent to be recognised at satellite scale. Later imagery preserves the same locality as a recurrent pale, bare or stressed surface expression.

The sequence supports the timing inference that the later pond-like feature emerged or became substantially more defined between the earlier 2017 epoch and the 2020–2021 imagery. The independent satellite record therefore corroborates the UAV archive at the level of location and persistence.

Figure 9. Cropped Google Earth chronology. The red ellipse identifies the locality of the later elongated depression or pond-like feature. It is not clearly expressed in the 2017 image, becomes faintly differentiated by 2020, and is established in the 2021 and 2025 epochs. Month labels reflect retained export names and should be checked against original Google Earth metadata before formal submission.

7.2 Visible change over one day

Two UAV observations made on 9 and 10 July 2026 show a visibly different distribution of pale surface material, green water and suspended or floating colour within the pond. Some of the difference may arise from wind, illumination, water-level change or camera geometry. Even with those limitations, the pair demonstrates that a water body can present differently after only one day, well within a reasonable institutional response interval.

A delayed inspection cannot safely be assumed to reproduce the reported condition. Where colour, films, turbidity, bubbling or fresh sediment are relevant, the initial report should trigger prompt photography and field measurement, followed by repeat observation rather than a single later visit.

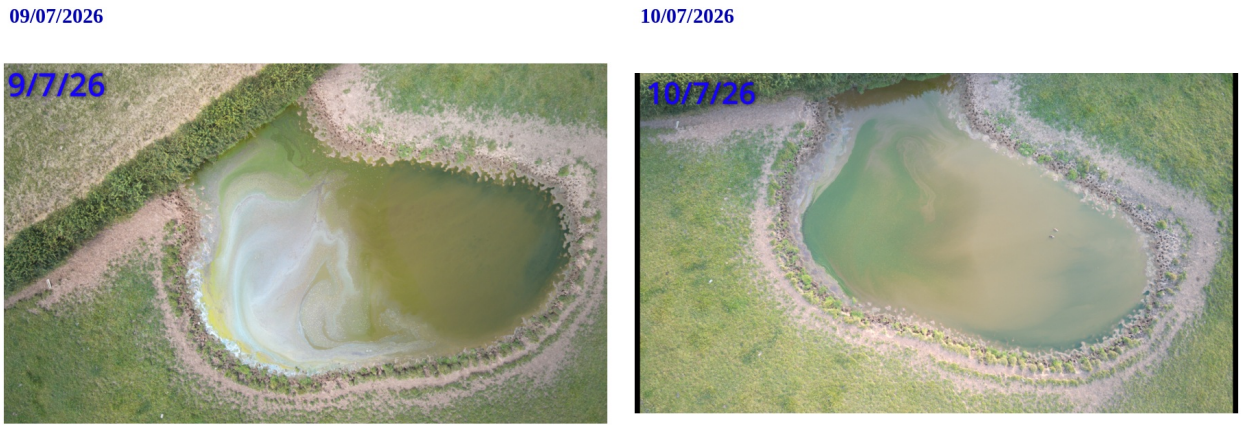

Figure 10. The pond-like feature on 9 and 10 July 2026. Over approximately 24 hours, the visible distribution of pale material and green-to-olive water changed during ongoing drought conditions.

8. Teardrop Pond as nearby contextual evidence

Teardrop Pond lies nearby, has a retained chronology beginning in 2017 and was observed bubbling in July 2026. It therefore provides context for the proposition that the surrounding field-water system has displayed repeated and changing surface expressions over a long period.

8.1 2017 change in water and margin appearance

The early May 2017 image records brown water before the later sequence of unusual appearances. The August 2017 frames show grey-green water, large exposed margins and changing surface material. A corrected 22 August DNG view records pale blue-green and whitish material within shallow residual water and on the margin. A separate observation from the same day records darker fluid that later dispersed. By 26 August, the water and exposed shoreline again present differently.

Figure 11. Selected Teardrop Pond sequence from May–August 2017. The corrected 22 August DNG view is included at lower left. The frames show substantial variation in water colour, exposed margin and pale or dark surface material.

8.2 2026 condition and reported bubbling

By July 2026, Teardrop Pond remained a persistent water body with olive-green water, extensive exposed margin and local bank retreat or trampling. Bubbling was observed during the July survey. Video, repeat fixed-point observation and direct dissolved-gas or headspace measurement would be required to distinguish biological gas production, entrained air, groundwater discharge or another cause.

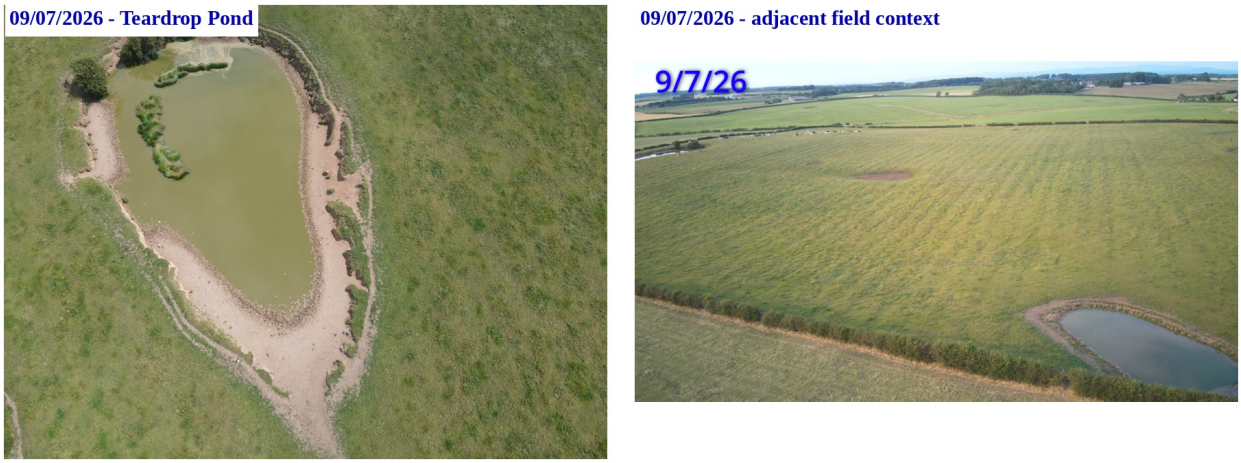

Figure 12. Teardrop Pond and adjacent field context on 9 July 2026. The pond remains olive-green with a broad exposed margin. Bubbling was observed during the survey but is not established by the still frame alone.

9. LiDAR evidence and relationship to the wider lowering corridor

The 2018–2022 LiDAR comparison provides an independent spatial dataset. The differenced surface was calculated as 2022 elevation minus 2018 elevation; negative values therefore represent relative lowering in the later surface. The selected scarp locality lies at the headward or outer end of an elongate area of negative elevation change that extends toward and encompasses the Preston New Road pad area.

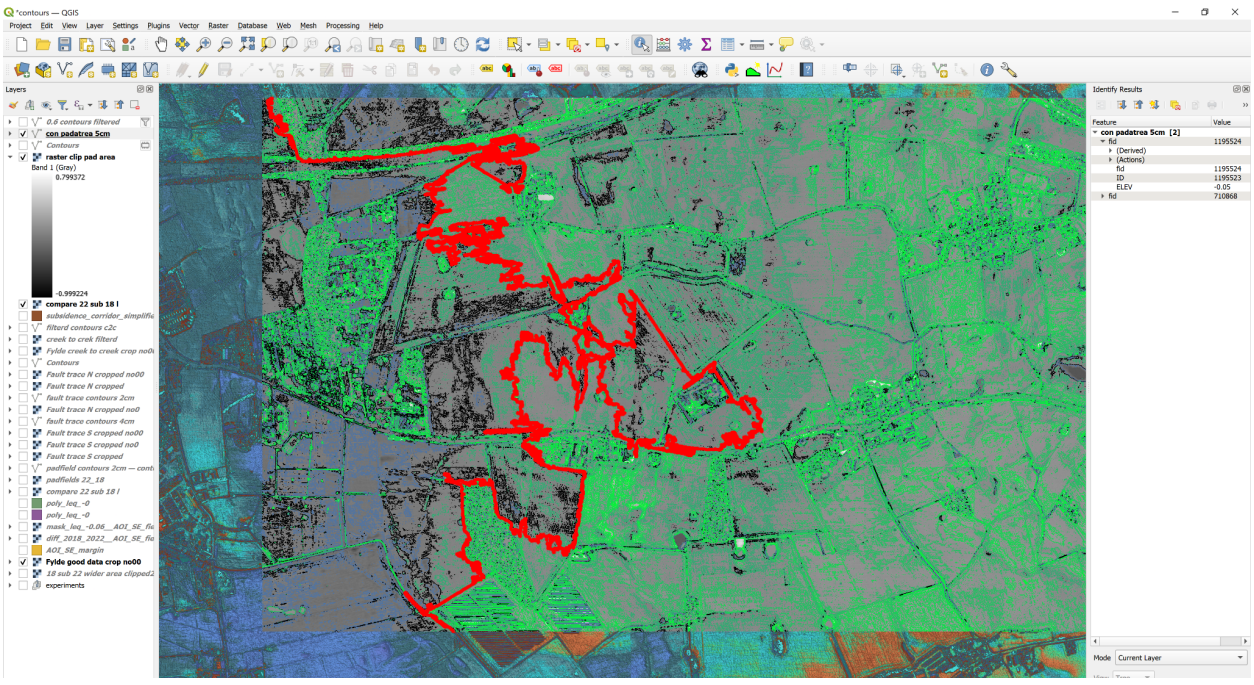

Figure 13. Wider QGIS view of the 2018–2022 differenced surface. Red outlines show selected negative-elevation contour geometry, including an elongate lobe extending from the scarp-field locality toward and around the pad.

A queried low point within the local lobe returns approximately –0.1892 m, equivalent to about 19 cm of relative lowering. The outer boundary used to delineate the coherent lobe is the –0.05 m contour. The broader 5 cm outline shows that the deepest cells occur within a spatially organised area rather than being treated as an isolated pixel.

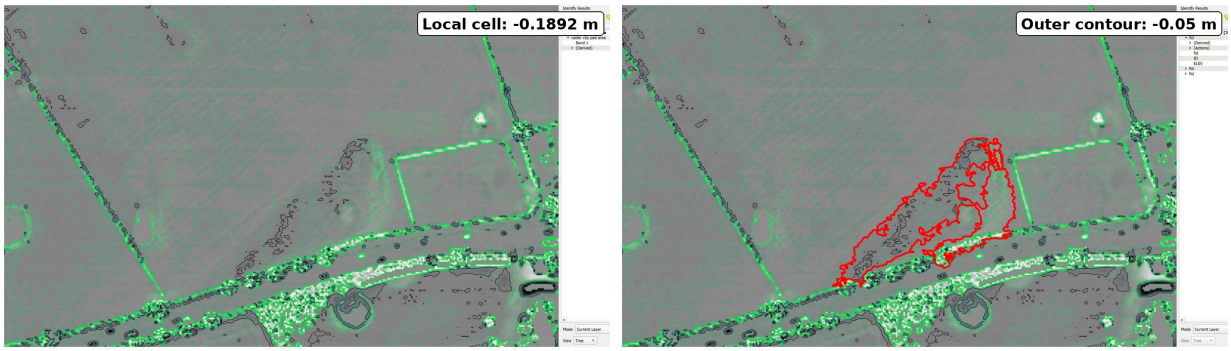

Figure 14. LiDAR values at the scarp-field lowering lobe. Left: queried raster cell recording –0.1892 m (approximately 19 cm). Right: red outline following the –0.05 m contour defining the outer edge of the local lobe. Values are relative 2022-minus-2018 surface differences.

The field depression and pond-like feature lie within the same broader pad-area lowering context. The LiDAR does not establish water movement, but it provides independent spatial support for treating the observed field features as part of a larger ground-adjustment pattern.

10. Seepage erosion as a working hypothesis

10.1 Process framework from Berhanu et al. (2012)

Berhanu et al. investigated erosion in a horizontal granular bed where water moved through a permeable layer and emerged at a free surface. Emerging flow removed grains, destabilised the bank and produced headward growth. The distribution of groundwater supply influenced the resulting form: boundary-fed flow produced elongated upstream-growing channels, while broadly distributed infiltration produced wider amphitheatre-like forms. Deeper channels developed steeper and rougher fronts through discrete bank failures or avalanches.

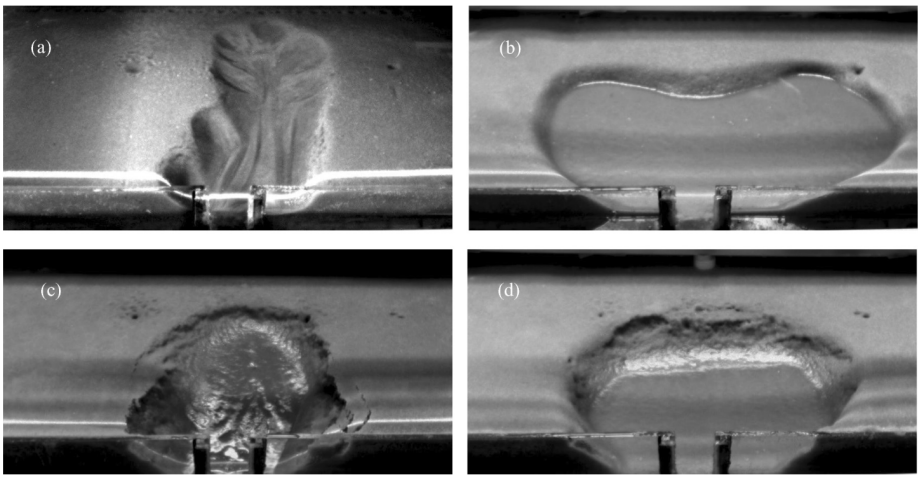

FIG. 4. Images of the four kinds of channels observed in the experiments. (a) An elongated channel fed by a flow from a reservoir at the back of the bed after $t = 916$ min with $d_{\text{outlet}} = 4$ cm, $\delta_H = 5$ cm, and no rainfall ($P = 0$). (b) A wider bifurcated channel fed by rain ($P_1 \sim 1.04 \times 10^{-4}$ m s^{-1}) is observed with $d_{\text{outlet}} = 4$ cm ($\delta_H = 5$ cm, $t = 595$ min). (c) An elongated deeper channel with steeper banks is observed with $d_{\text{outlet}} = 8.0$ cm ($P = 0$, $\delta_H = 6.8$ cm, $t = 311$ min). (d) The channel is deeper with $d_{\text{outlet}} = 8.0$ cm and wider with rain ($P = P_1$, $\delta_H = 2$ cm, $t = 240$ min).

Figure 15. Experimental seepage-erosion forms reproduced from Berhanu et al. (2012), Figure 4. The images show elongated and wider amphitheatre-like channels with differing bank forms under controlled groundwater supply. Reproduced for qualitative process comparison only.

10.2 Why the site is a good fit for testing the hypothesis

- Persistent water-sensitive locality and nearby ponding provide a plausible hydraulic context for repeated near-surface water expression.
- The abrupt head/scarp-like margin and exposed apron are compatible with bank destabilisation and headward removal of material.
- Rounded hollows or scallops along the head are qualitatively comparable with discrete local failures at an erosion front.
- Sediment expression in March 2025 is consistent with mobilisation and redeposition of material.
- Progressive development through time is consistent with an active or episodically reactivated process rather than a single wear event.
- The feature lies at the head of a coherent LiDAR lowering lobe, providing independent evidence of ground adjustment aligned with the mature surface expression.
- Similar scarp-like forms occur elsewhere in the wider corridor, supporting testing of a repeated process rather than treating each form as unique.

The fit is cumulative rather than diagnostic. The hypothesis becomes defensible because temporal development, hydrological context, sediment expression, scarp morphology and LiDAR lowering coincide at one fixed locality.

10.3 Important differences from the laboratory model

The Fylde field is not a horizontal bed of uniform glass beads. It contains vegetation, cohesive and heterogeneous superficial soils, livestock activity, agricultural compaction, drainage alterations and variable rainfall. Surface runoff may interact with subsurface flow. These differences prevent direct scaling or shape matching. Berhanu et al. are used here as a mechanistic framework: subsurface flow can focus erosion, promote headward growth and destabilise a front.

11. Alternative explanations: animals and agriculture

Livestock and agricultural use are necessary alternative explanations because animals, machinery, gateways and repeated turning can create bare ground, compaction, tracks and local ponding. The archive itself shows stock in adjacent fields and curved vehicle or access marks. These influences may have modified the features.

11.1 Why they are weak as complete explanations

- The mature scarp form is not limited to a narrow track or gateway; it includes a broad irregular apron, locally abrupt head margin and multiple hollowed elements.
- The locality shows recurring wetness and ponding before and alongside the mature scarp, making water-sensitive ground part of the sequence rather than a consequence of one recent traffic event.
- A separate sediment-stained depression appears near the main feature, and a nearby depression becomes water-filled.
- The field depression and pond-like feature recur across years and are visible in independent imagery.
- The cluster lies within a coherent LiDAR lowering zone with approximately 5 cm lowering at its outer edge and local values approaching 19 cm.
- Curved tracks appear to approach, skirt or be redirected around the feature in several frames, which is compatible with vehicles or animals responding to weakened or wet ground.

11.2 Balanced interpretation

Animals and farming may enlarge exposed margins, disturb sediment, compact wet ground or reveal an underlying weakness. They are not strong stand-alone explanations for the full temporal, hydrological and LiDAR pattern. Farm-management history, drainage works and livestock intensity should be obtained as part of ground-truthing rather than presumed either way.

12. Integrated interpretation of the local feature system

The scarp-like feature, field depression, pond-like feature and Teardrop Pond do not need to be identical phenomena to justify coordinated assessment. They can be understood as different surface expressions within one small, water-sensitive field system showing persistent recurrence through time, local progression from subtle stress to exposed ground, repeated or nearby ponding, sediment expression, rapid short-interval change and spatial coincidence with a broader LiDAR lowering lobe.

Working local-system hypothesis

The locality contains a broader zone of shallow water reorganisation and ground adjustment, within which different field-scale expressions have appeared over time, including scarp-like ground loss, exposed depressions, pond formation or enhancement and changing pond condition.

13. Monitoring implications and proportionate investigation

The most informative conditions may be transient: bubbling can stop, films can disperse, suspended sediment can settle, pond colour can reorganise and fresh margins can be trampled or weathered. A response that is reasonable in administrative time may still be too slow to preserve the original physical state.

8. **Topographic survey:** Undertake RTK-GNSS, total-station or repeat photogrammetric survey across the scarp, field depression, pond-like feature, Teardrop Pond and intervening ground, tied to a common datum.
9. **Shallow groundwater measurement:** Install a small number of shallow piezometers or temporary standpipes to establish water levels, gradients and response through wet and dry periods.
10. **Field parameter capture:** Record water level, electrical conductivity, temperature, pH, dissolved oxygen, oxidation-reduction potential and turbidity before disturbance.
11. **Paired affected/control sampling:** Collect water, pore-water and sediment samples from affected locations and suitable controls, with analytes selected through a documented source–pathway–receptor assessment.
12. **Drainage assessment:** Inspect and record field drains, grips, culverts, any infilling and any agricultural drainage changes.
13. **Repeat fixed-point observation:** Re-image the July 2026 locations after sustained wet and dry periods and as soon as possible after any renewed bubbling, colour, film or fresh sediment report.
14. **Pre-disturbance hold points:** Where deconstruction, restoration or land management could alter the features or shallow flow pathways, establish explicit hold points so evidence is not removed before assessment.

The key operational point is that the area should be treated as one surveyed network rather than a series of unrelated individual call-outs.

14. Conclusions

15. The aerial archive records progressive formation of a persistent scarp-like depression complex between 2017 and 2026.
16. Repeated ponding and water-sensitive ground occur in the immediate vicinity of the scarp, and a nearby depression develops into a persistent pond.
17. A separate field depression becomes progressively more distinct through time and culminates in broad exposed sediment with a nearby secondary bare patch by July 2026.
18. Independent Google Earth imagery supports the emergence or substantial definition of a pond-like feature between the earlier 2017 epoch and the 2020–2021 imagery.
19. The pond-like feature changed visibly between 9 and 10 July 2026, showing that relevant site conditions can alter within a normal response interval.
20. Teardrop Pond has its own chronology of changing water and margin appearance from 2017 to 2026 and was observed bubbling in July 2026; it is relevant contextual evidence within the same field-water setting.

21. The combined features lie close together and within the broader 2018–2022 LiDAR lowering context, which includes a coherent local lobe bounded by an approximately –0.05 m contour and containing local values approaching –0.189 m.
22. The combined morphology, temporal development, ponding, sediment expression and LiDAR geometry make seepage-related ground adjustment a reasonable working hypothesis to test.
23. Animals and agriculture may have modified the forms, but they are not strong complete explanations for the whole temporal, hydrological and spatial pattern.
24. The immediate regulatory question is whether the combined chronology warrants a coordinated site inspection and targeted measurement programme before the landscape changes further. On the evidence assembled here, that threshold is met.

References

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Nye, D. (2026). LiDAR Comparisons 2018 to 2022 of the Fylde Coast.

Nye, D. (2026). Preston New Road: Technical Assessment of Hydrogeological Risk, Monitoring, and Governance Limits.

Appendix A. Full temporal plates and image log

The plates below preserve the broader temporal sequence used in the scarp assessment. Each panel retains the date embedded in the supplied frame. Camera angle, altitude, season, crop condition and illumination vary.

Plate A1. September 2017 to March 2018: early wetness, pale or bare ground and recurrent surface differentiation at the fixed field corner.

Plate A2. April to July 2018: adjacent ponding, changing vegetation and emergence of a more structured local surface expression.

Plate A3. September 2018 to May 2019: persistent water-sensitive ground and transition toward a distinct exposed feature.

Plate A4. May to October 2019: scarp-like geometry becomes pronounced and a nearby depression becomes water-filled.

Plate A5. July 2024 to July 2026: persistent pond, March 2025 sediment expression and mature compound scarp morphology.

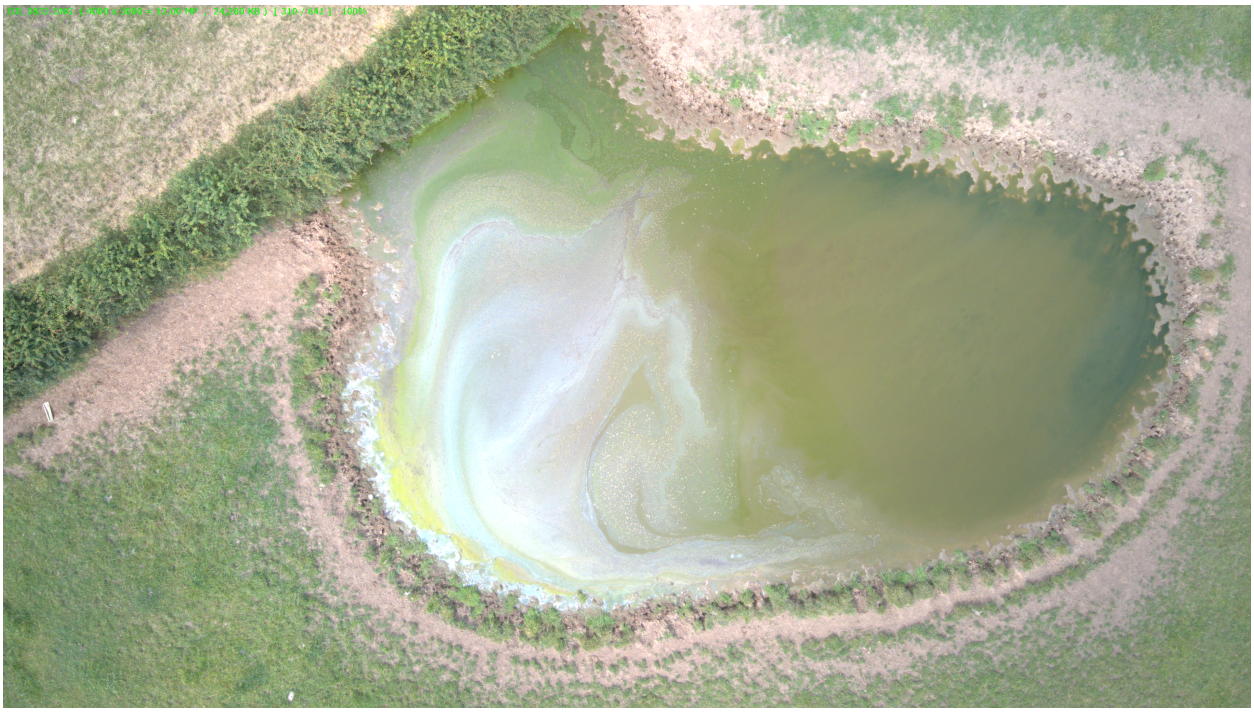

Plate A6. July 2026 nearby wet patch and wider field context retained from the original scarp note.

A.2 Consolidated field-depression and pond image log

Ref.	Date	Feature/source	Primary use or observation
A1	27/10/2017	Field depression	Early differentiated locality
A2	2018–2019	Field depression	Intermittent wetness and standing water
A3	July 2024	Field depression	More distinct bare or depressed expression
A4	December 2025	Field depression	Persistent dark or stressed area
A5	9 July 2026	Field depression	Broad exposed sediment and

			secondary bare patch
A6	2017	Google Earth	Later pond-like feature not clearly expressed
A7	April 2020	Google Earth	Faint differentiated precursor
A8	July 2021	Google Earth	Feature established at satellite scale
A9	April 2025	Google Earth	Persistent later expression
A10	9 July 2026	Pond-like feature	Pale material and green/olive water
A11	10 July 2026	Pond-like feature	Changed distribution one day later
A12	2 May 2017	Teardrop Pond	Brown-water baseline in supplied sequence
A13	16 August 2017	Teardrop Pond	Grey-green water and exposed margin
A14	22 August 2017	Teardrop Pond	Wider pond and margin condition
A15	22 August 2017	Teardrop Pond – DNG	Corrected close view of pale blue-green/whitish material
A16	26 August 2017	Teardrop Pond	Further change in water and margin appearance
A17	9 July 2026	Teardrop Pond	Olive-green water, exposed margin; bubbling observed during survey

Appendix B. Image provenance, interpretation controls and terminology notes

B.1 Source handling

The UAV images derive from the author's retained aerial archive. The report uses selected date-labelled stills and local composites prepared for comparison. Original files, metadata and full-resolution frames should be retained separately from the publication copy.

B.2 Interpretation controls

- Differences in angle, altitude, lens, illumination, season and vegetation condition can change apparent relief and colour.
- Pond-water colour is not a chemical measurement and should not be used to name a contaminant or source.
- Bare ground may be enlarged by cattle, vehicle traffic, drought or agricultural management even where an underlying low or wet area predates that disturbance.
- Google Earth imagery is corroborative; exact capture dates and image provenance should be checked in the source history.
- LiDAR values are relative 2022-minus-2018 surface differences and should not be described as a surveyed present-day depth.
- The relationship between the field depression, pond-like feature, Teardrop Pond, scarp complex and pad remains a hypothesis until tested by common-datum topography, water levels and chemistry.
- Observed bubbling should be supported by retained video and, where repeated, direct gas or flow measurements.

B.3 Publication status

This is a working location study prepared for review. It should be proofread against the original image archive, original Google Earth date history and source LiDAR project before formal submission.

Appendix C. Experimental seepage comparison

The following figure from Berhanu et al. is retained to show how experimental channel depth and outline evolve through time under different groundwater-supply conditions. It is not a template against which the Fylde feature is mechanically matched.

15 cm from the outlet.

fall inside the channel decreasing the seepage contribution,

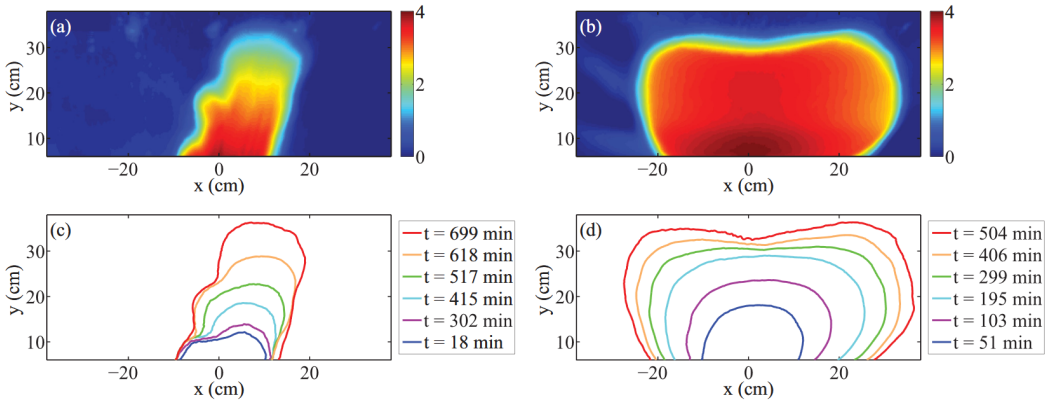

FIG. 5. (Color online) Comparison of channels in a shallow channel regime where the capillary rise is of order of the channel depth. (a) Depth map of the channel observed after $t = 677$ min with $\delta_H = 5$ cm, $P = 0$, and $d_{\text{outlet}} = 4$ cm. Depth is indicated with a scale in centimeters measured from the initial flat bed. (b) Depth map of channel observed after $t = 300$ min with $P_1 \sim 1.04 \times 10^{-4}$ m s^{-1}, $\delta_H = 0.9$ cm, and $d_{\text{outlet}} = 4$ cm. (c,d) The corresponding channel shape evolution for the depth $d(x, y) = 1$ cm contour increase in length with time.

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Figure C1. Experimental depth maps and evolving 1 cm depth contours from Berhanu et al. (2012), Figure 5. Laboratory dimensions, materials and boundary conditions differ fundamentally from the field setting.